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Begonia kibambanganensis and *B. melanosticta* (Begoniaceae), Two New Species from Sabah, Borneo

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Summary. Two new species of *Begonia* (Begoniaceae), *Begonia kibambanganensis* V.S. Guanih & F.Y. Chong and *B. melanosticta* F.Y. Chong & V.S. Guanih are described from the Malaysian state of Sabah in northern Borneo. Both belong to section *Petermannia*. *Begonia kibambanganensis* is currently known only from lowland dipterocarp forest in the Crocker Range Park, Penampang district, but *B. melanosticta* is found within two localities in Tongod district.

Borneo is rich in *Begonia* species, the majority of which have local distributions and are narrowly endemic. Begonias are a common component of the forest understorey and are often conspicuous for their leaves that have attractive shapes, colour, patterns and textures. Several native Bornean species have potential value as ornamental plants. However, the majority of *Begonia* species are still un-named and undescribed. For instance, 19 species have been recorded from the well botanised Kinabalu massive (Sands, 2001) but many more recently found species are new and await description (Rimi, *pers. obs*). The aim of this study is to describe two new attractive *Begonia* species that have potential as ornamental plants.

Methodology

The *Begonia* species were collected during the scientific expeditions to the Crocker Range Park, Inobong, Penampang, Sabah, and to Sungai Imbak Forest Reserve, Tongod, Sabah. Field work was carried out to collect and record (a) fertile species of *Begonia* for which the first set of herbarium specimens is deposited at the SAN Herbarium, Sandakan with duplicates distributed according to the SAN guidelines for plant deposition. All the herbarium specimens were processed using standard herbarium methods, and identified to species level. (b) for begonias encountered without flowers but with mature fruits, seeds were collected to germinate and cultivate by standard seed culture methods in the Forest Research Centre Nursery, Sandakan. Once they flower, herbarium specimens are made.

The New Species Described

1. Begonia kibambanganensis V.S. Guanih & F.Y. Chong **sp. nov. (**Section *Petermannia*)

It is most similar to *Begonia malachosticta* Sands (1990: 61) in which the leaves are spotted persistently on the upper surface of the mature foliage. However, *B. kibambanganensis* is different in having a variegated lamina with white spots that are distributed closely between the veins and sometimes coalescing (vs. mauve-pink to olive-green spots in *B. malachosticta*). The two tepals of the male flowers in *B. kibambanganensis* are pinkish white (vs. four tepals, greenish cream or white, flushed with pink to pale salmon-pink in *B. malachosticta*) while the female flowers have dark red tepals (vs. greenish cream to pale salmon-pink tepals) and the three wings in the ovary are unequal, two are 4–6.3 mm wide and one narrow wing is *ca.* 1.2 mm wide (vs. wings subequal, (9–)10–15mm wide at the distal end). Type: *V.S. Guanih & F.Y. Chong SAN 157265,* Borneo, Sabah, originally from Penampang District, Inobong, Kibambangan Waterfall area, cultivated in Forest Research Centre, Sepilok, 24 September 2012 (holotype SAN!). **(Fig. 1)**

Cane-like begonia to 21.5 cm tall, whole plant glabrous. Stem erect, red, succulent, *ca.* 4.8 mm diameter; internodes 3–4 cm long, thicker at nodes. Stipules lanceolate, pale green, 14–20 × 0.06–11 mm, margin entire, apex acute, caducous. Leaves alternate, distant and hanging downwards; petioles 27–57 mm, red and grooved above; lamina variegated with green and white spots between veins, each big spot with one or two hairs in centre, 7.9–8.1 × 6–7 cm, fleshy in life, oblique, asymmetrical, broad side 4.4–5.1 cm, base broadly ovate, basal lobe 12–16 mm, margin doubly toothed, apex acuminate, acumen 0.9–1.5 cm; main veins palmate-pinnate, red towards the petiole and with 3 veins on each side of the midrib and with 3 veins in basal lobe, impressed above near the junction between the lamina and petioles. Inflorescences terminal, pinkish white and shorter than petioles, protogynous, 1.6–1.8 cm long, male inflorescence with dense clusters of 16 male flowers per single cymose cluster. Female inflorescence branches to *ca.* 4.2 cm long. Bracts caducous and not found in female flowers. Bracts of male flowers broadly oval, *ca.* 11 × 9 mm, pale green, margin entire.

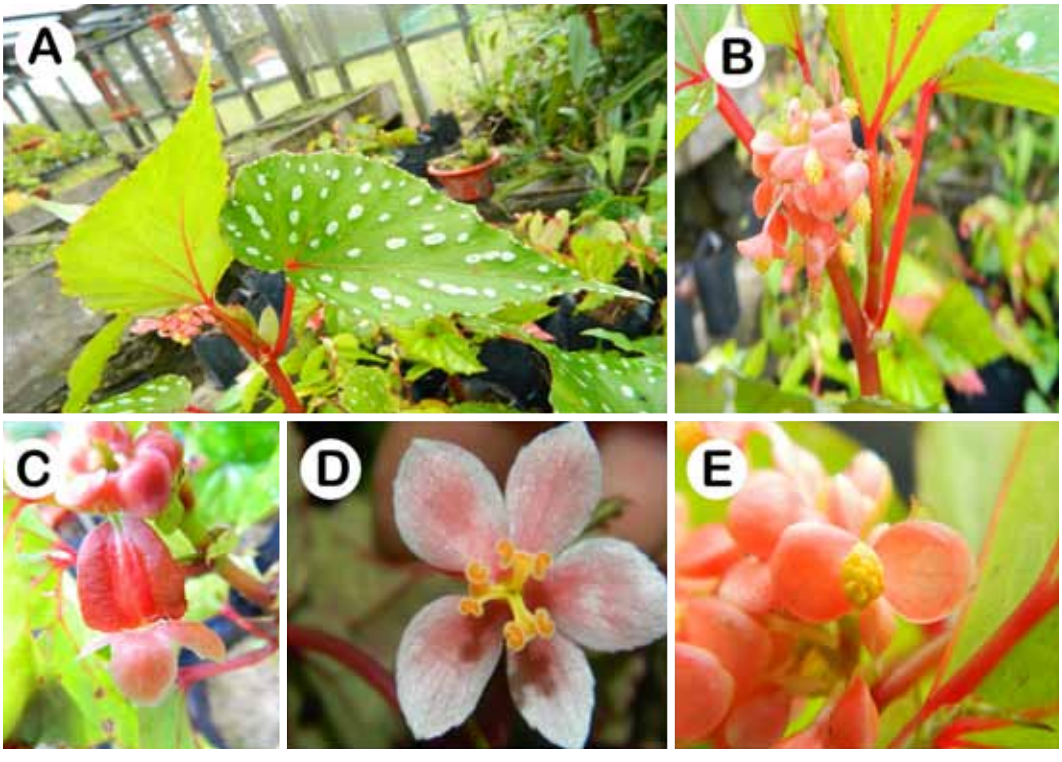

Fig. 1. *Begonia kibambanganensis*. **A.** Shoot showing the upper and lower leaf surface; **B.** Male inflorescence; **C**. Female flower, side view; **D.** Female flower, top view; **E.** Male Flower. All photos from *SAN 157265* by V.S. Guanih.

Bracteoles of male flowers broadly oval, *ca*. 9–11 mm long. Male flowers: pedicels pinkish white, *ca*. 13 mm long; tepals 2, pinkish white, oval, *ca*. 6 × 5 mm long, margin entire, apex rounded; stamens *ca*. 27, cluster narrowly ovate, stalk *ca*. 0.2 mm long; filaments *ca*. 0.1 mm long, dirty yellow; anthers yellow, apex rounded, 0.88 × 0.69 mm long. Female flowers**:** pedicels light green, *ca*. 8.5 mm long; ovary dark red, *ca*. 37 × 21 mm long, wings 3 to 5, uequal, parallel and rounded distally, broader wing, 4–6.3 mm wide, narrower wing, *ca*. 1.2 mm wide, locules 3, placentas bilamellate; tepals 5, pinkish white, ovate, margin minutely toothed, apex rounded, outer tepals 3, 11–12 × 10–11 mm, inner tepals 2, 9–10 × 7–8 mm; styles 3, bright yellow, *ca*. 2.7 mm long and divided to base, stigma yellow, in a spiral papillose band. Capsules (immature) broadly oblong, dark red, 2.2 × 1.5–1.6 cm; locules 3, wings equal, *ca*. 5 mm wide, fleshy, dehiscing between the wings and locules.

ETYMOLOGY. Named after the Kibambangan Waterfall at Inobong, Crocker Range Park from where it was first collected.

ECOLOGY. Lowland dipterocarp forest at 447 m elevation adjacent to waterfall, on damp, shady, mossy substrates.

DISTRIBUTION. Borneo, Sabah. Penampang District: Inobong, Crocker Range Park, Kibambangan Waterfall area.

SPECIMENS EXAMINED—BORNEO. SABAH: Penampang District: Inobong, Crocker Range Park, Kibambangan Waterfall area. 21 January 2015*, Rossiti Karim, Handry Mujih and Wilson Salikun, SNP 32964* (SNP); Originally from Penampang District, Inobong, Kibambangan Waterfall area, cultivated in Forest Research Centre, Sepilok, 24 September 2012, *V.S. Guanih & F.Y. Chong SAN 157265* (holotype SAN!).

NOTES. This species is currently cultivated in the Forest Research Centre Nursery, Sandakan, from seed collected by Martin Tuyuk during the National Park Expedition on 24 September 2012. At present, only the holotype (*SAN 157265*) is available but as the plant continues to grow and flower, isotypes will be prepared for distribution.

2. **Begonia melanosticta** F.Y. Chong & V.S. Guanih **sp. nov.** (Section *Petermannia*)

It is similar to *B. fuscisetosa* (Sands, 1997: 433) in its short petiole, and the presence of a row of stiff bristles on the upper lamina surface but it is different in its thick hirsute stems (vs. slender and pilose as in *B. fuscisetosa*), the presence of a row of raised black spots between the veins and the many tiny scattered black spots in the lamina (vs. not present in *B. fuscisetosa*) and the male flowers that have 4 tepals, inner 2 tepals white, rosy red at the base (vs. 2 white tepals). Type: *Dayang Fazrinah Awg. Damit SAN 156103,* Borneo, Sabah, Tongod District, Gunung Rara Forest Reserve, 26 April 2014 (holotype SAN!; isotype KEP!). (**Fig. 2**)

Erect begonia to 1 m tall. Stems reddish brown, *ca.* 6 mm thick, fleshy, internodes 1.5–4.5 cm, brown thick hirsute, becoming woody. Stipules green, keeled, lanceolate, apex setose, seta 2–3 mm long, glabrous, 12–15 × 5–7 mm, margin entire, persistent. Leaves alternate, not oblique, distant, held horizontally; petioles pale brownish with reddish brown hairs, 9–15 mm long, flat above; lamina green above with a row of raised black spots between the veins each with a magenta–black hair in the centre and with many more small black spots scattered over the surface, glossy, fleshy when fresh, ovate to obovate, slightly asymmetrical, 12–15 × 5–7 cm, broad side 3–4.5 cm wide, base unequal, basal lobes rounded, 4–6 mm, margin minutely toothed, apex acuminate, acumen 1–1.2 cm long; main veins pinnate, impressed above, beneath prominent and with sparse red hairs, 4 veins on each side of the midrib, with a fine pair of veins in the basal lobe. Inflorescences axillary, pubescence with white hairs, erect, branched cyme, protogynous, 2.7–4.5 cm in the female phase, *ca.* 7 cm long in the male phase, peduncle *ca.* 5 mm long. Bracts similar to stipules but slightly smaller, 10–12 × 5 mm, margin entire, persistent. Bracteoles pale green sometimes tinged magenta, in a distinct

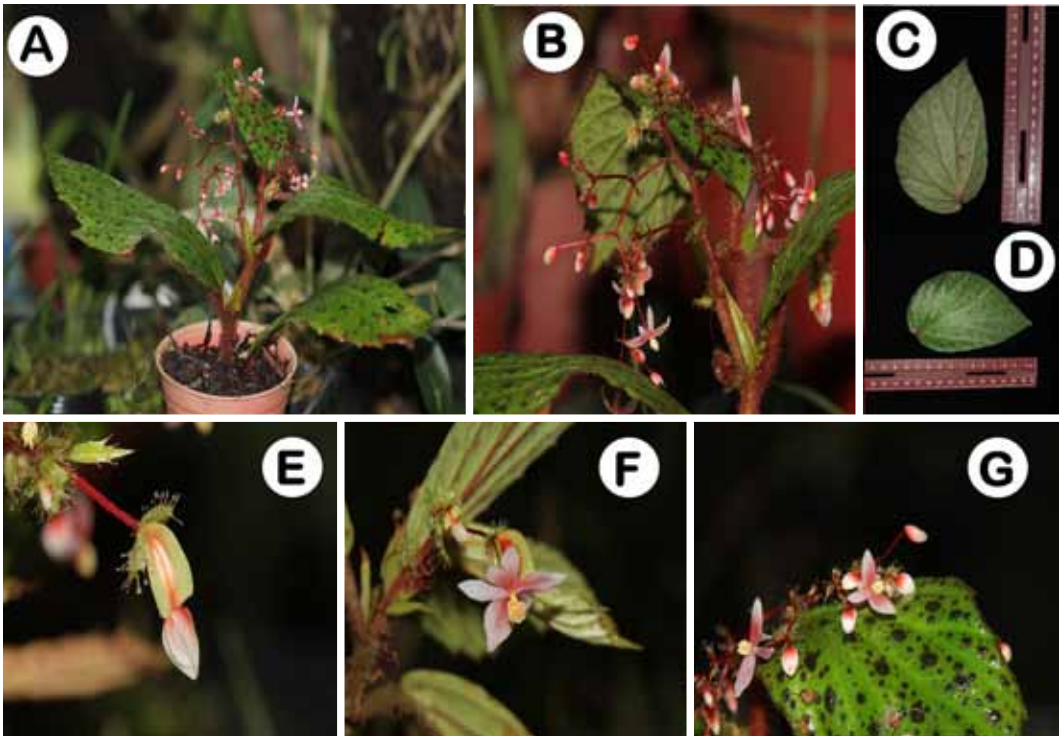

Fig. 2. *Begonia melanosticta*. **A**. Shoot showing the upper and lower leaf surface; **B.** Male inflorescence; **C.** Lower surface of lamina; **D.** Upper surface of lamina; **E.** Female flower, side view; **F.** Female flower, top view; **G.** Male Flower. All photos from *KNP 36815*. Photos **A**–**B**, **E**–**G** by Yabainus Johalin; Photos **C** & **D** by D.F. Awg. Damit.

pair, perpendicular to the rachis, triangular, 5–8 × 6–7 mm, margin with long glandular hairs, slightly scalloped, persistent. Male flowers: pedicels magenta, 8–16 mm long; tepals 4, outer 2 tepals broadly oval, glabrous, 5–9 × 4–5 mm, apex blunt to acute; inner 2 tepals white and rosy red at the base, glabrous, narrowly oval, 4–6 × 2 mm, margin entire, apex slightly acute; stamens *ca*. 18, cluster narrowly conical, subsessile; filaments lemon yellow, *ca*. 0.2 mm long; anthers lemon yellow, oblong, *ca*. 1.2 × 0.3 mm, apex emarginate. Female flowers: pedicels 13–23 mm long, red, glabrous; ovary red, wings green, oblong, 13–14 × 10–12 mm, wings 3, equal, locules 3, placenta bilamellate with many ovules on both surfaces; tepals 5, white, rosy red towards the base on the outside, ovate, outer tepals 8–9 × 5–7 mm and inner tepals *ca*. 9 × 4–5 mm, margin entire, apex acute; styles 3, pale yellow, *ca*. 4 mm long, divided near base, Y-shaped; stigma pale yellow, large papillose and forming a continuous twisted band. Capsules: pedicels thin but stiff, *ca*. 2 cm long; fruit *ca*. 15 × 12 mm, glabrous, locules 3, wing subequal, narrowed to the base, rounded distally, *ca*. 4 mm wide, thinly fibrous, dehiscing between the locules and the wings.

ETYMOLOGY. Named for the conspicuous and attractive black spots on the upper leaf surface (Greek: *melano* = black + *sticta* = spotted).

ECOLOGY. In disturbed heath forest at 205 m elevation.

DISTRIBUTION. Borneo, Sabah. Tongod District: Gunung Rara Forest Reserve.

SPECIMENS EXAMINED—BORNEO. SABAH: Tongod District: Kuamut, cultivated at Kipandi Butterfly Farm, 26 August 2014, *Julia & Kiew KNP 36815* (KEP, SAN, SAR, SNP); Tongod District, Gunung Rara Forest Reserve, 26 April 2014, *Dayang Fazrinah Awg. Damit SAN 156103* (holotype SAN!; isotype KEP!).

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